

IN THE UNITED STATES COURT OF FEDERAL CLAIMS

<p>TAYLOR ENERGY COMPANY LLC,</p> <p style="text-align: center;">Plaintiff,</p> <p style="text-align: center;">v.</p> <p>THE UNITED STATES,</p> <p style="text-align: center;">Defendant.</p>	<p>)</p> <p>)</p> <p>)</p> <p>)</p> <p>)</p> <p>)</p> <p>)</p> <p>)</p> <p>)</p> <p>)</p>	<p>No. 16-12C</p> <p>Judge Nancy B. Firestone</p> <p>Declaration of Dr. Jacqueline Michel</p> <p>Pursuant to 28 U.S.C. § 1746</p>
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DR. JACQUELINE MICHEL, of full age, hereby deposes and says:

1. I am President of Research Planning, Inc., a science-technology consulting firm that brings science-based solutions to coastal and environmental management challenges faced by government, industry and non-profit organizations.

2. I am also a geochemist and have over 40 years of experience as part of the National Oceanic and Atmospheric Administration (NOAA) Scientific Support Team.

3. I served as a representative of NOAA on the Sheen Source Location Working Group (SSLWG). In June 2017, I was asked, as part of my responsibilities on the SSLWG, to prepare a summary memorandum for the SSLWG that was provided to the Unified Command (UC) for the Taylor incident. I was also asked to prepare the draft and final memorandum for the UC after review by the SSLWG of the studies conducted by Taylor to determine the source of the surface oil sheens.

4. Thus, I prepared the November 2017 SSLWG memorandum that was presented to the UC. The November 17 SSLWG memorandum was the only document that received a consensus confirmation by all of the members of the SSLWG. It is attached to my declaration as Exhibit A.

5. The November 2017 SSLWG memorandum to the UC presented only the consensus determinations taken from the SSLWG review of five reports prepared by contractors to Taylor Energy. These five reports were, specifically:

- *The SSLWG Introduction and Data Collection*, by Wade Bryant, C-K Associates, Inc.
- *An Acoustic Report* by Richard Camilli, Navistry, Inc.
- *A Forensic Analysis of Surface Sheens from the Sheen Source Location Working Group Field Acquisition and a Comparison to Historical Samples at the MC20 site*, by Ed Overton, Louisiana State University and Chris Reddy, Makepeace Environmental Solutions, LLC (Overton and Reddy 2017)
- *A MC20 Release Analysis*, by Steve Fitzgerald, Intuitive Machines
- *An Assessment for the Potential for Spontaneous Release of Oil from Contaminated Sediments in the Area of MC-20*, by Danny Reibel, Texas Tech University.

6. These five reports in their entirety were not considered to be part of the November 2017 SSLWG memorandum and they were not listed as appendices to the memorandum. The five reports were referenced only in the November 2017 SSLWG memorandum with respect to the determination of the source of the sheens.

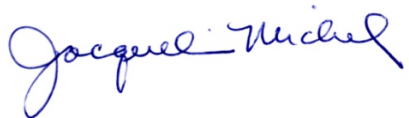
7. It is important to recognize that not all the SSLWG members reviewed each of these five reports or confirmed their agreement with the conclusions in each of these reports. For example, only two of the SSLWG's NOAA members, Steven Wall and myself, reviewed and commented on all of these reports. The other government members of the SSLWG mostly responded to the

Wall/Michel comments, if at all. Thus, the entirety of these five reports prepared by Taylor's contractors were not consensus reports.

8. In fact, I noted my disagreement with several of the conclusions set forth in Overton and Reddy (2017). For example, I noted, as is recorded in an appendix to the Overton and Reddy report, that "All of the forensic analysis conducted does not preclude the presence of a leaking well at the site." Overton and Reddy (2017) at Appendix 6, p. 163, ¶ 5. I also stated that "It is not correct to point out that the oil in the samples is not 'a single reservoir oil' or from a 'single leaky well.' The wells released oils from different reservoirs, so no wonder that there are subtle differences in this mixture of oil sources being released from the site." *Id.* These comments refer to the chemical analysis of sediments around Dome C, near the scour pit that the SSLWG agreed was the source of the oil/gas plumes.

9. Furthermore, in specific reference to Appendix 1 of Overton and Reddy (2017), I stated that: "Many of the bulleted points are very subjective and not supported by the chemical results cited. Recharge from one or more wells would not lead to a more homogenous contamination; it would still be a heterogeneous mixture." *Id.* at p, 165, ¶ 7.

I declare upon this 10th day of September, 2018, under penalty of perjury that the foregoing is true and correct.



Dr. Jacqueline Michel

MEMORANDUM

To: Unified Command for the Taylor Energy Oil Discharge at Mississippi Canyon Area, Block 20 (MC-20)

From: Sheen Source Location Working Group (SSLWG)

Date: 17 November 2017

Re: SSLWG Final Report on the Source

The SSLWG Charter dated 20 January 2016 included the following objectives:

- a. Determine Sensor and Platform Package Capable of Identifying the Location of the Primary Sheen Source at the MC-20 Site
- b. Establish a Survey Protocol and Data Analysis Method for the Sensor and Platform Package Identifying the Location of the Primary Sheen Source at the MC-20 Site
- c. Secondary Objective: Identify additional sheen source location(s) if possible

The initial survey plan was developed in July 2016 and finalized in early 2017. The field data collection effort was conducted from 28 February to 10 April 2017. The preliminary results of these surveys were discussed among the SSLWG and presented to the Unified Command during meetings at the BSEE offices in New Orleans, LA on 6-7 June 2017. Draft technical reports were submitted to the SSLWG for review in late September 2017.

The SSLWG members reviewed and commented on the draft and final draft reports, that were submitted following the 2017 field studies at the MC-20 site, as listed below:

- SSLWG Introduction and Data Collection, by Wade Bryant, C-K Associates, Inc.
- Acoustic Report, by Richard Camilli, Navistry, Inc.
- Forensic Analysis of Surface Sheens from the Sheen Source Location Working Group Field Acquisition Operations and a Comparison to Historical Samples at the MC20 site, by Ed Overton, Louisiana State University and Chris Reddy, Makepeace Environmental Solutions, LLC
- MC20 Release Analysis, by Steve Fitzgerald, Intuitive Machines
- An Assessment for the Potential for Spontaneous Release of Oil from Contaminated Sediments in the Area of MC-20, by Danny Reible, Texas Tech University

Each of the authors responded to comments provided by the SSLWG members and revised their reports accordingly. Therefore, the SSLWG considers these reports as final and the 2017 studies as completed.

The SSLWG has come to the following conclusions:

1. The primary location of the source of the oil sheens at the MC-20 site is a conical erosional pit that is approximately 20 feet deep and 160 feet in diameter, that is

located on the northeast side of the jacket from the toppled production platform, close to the original location of containment domes C and D (Figures 1 and 2). Two plumes (most of the time) of oil and gas were observed being released from the erosional pit (Figures 3 and 4). This erosional pit has migrated to the west by about 2 feet between 2015 and 2017. The erosional pit is different in shape, depth, and migration patterns from other pockmarks and depressions in the vicinity.

2. Water column anomalies were identified by acoustics at two other areas: 1) in the vicinity of the former well bay and 2) approximately 1,000 feet east of the platform jacket (Figure 3). However, these locations generate water column anomalies that are weaker, intermittent, and emit mostly dry gas with no associated sheen.
3. The Acoustic Doppler Current Profiler (ADCP) data indicate that the currents at the MC-20 site are complex, with water flow in different directions at depth and over time.
4. Using the ADCP data, oil droplet and gas bubble transport modeling (both from the “bottom up” and “top down”) confirmed that the sheens and dry/oiled gas observed on the surface during aerial observations originated from the erosional pit near Domes C and D.
5. The chemical forensic analysis of discrete oil droplets collected in March and April 2017 indicated that the oil was slightly to moderately weathered, generally similar to each other but did show some heterogeneity, and similar to sheens collected in 2012 and 2013. These sheens were most similar in composition to the heavily oiled sediments collected by divers in February 2013 around Containment Dome C (Diver Cores), and not similar to the heavily oiled sediments collected in July 2012 near the former well bay and around the jacket (Piston Cores and Box Cores). These results are consistent with the source of the sheens as emanating from the erosional pit near Containment Dome C.

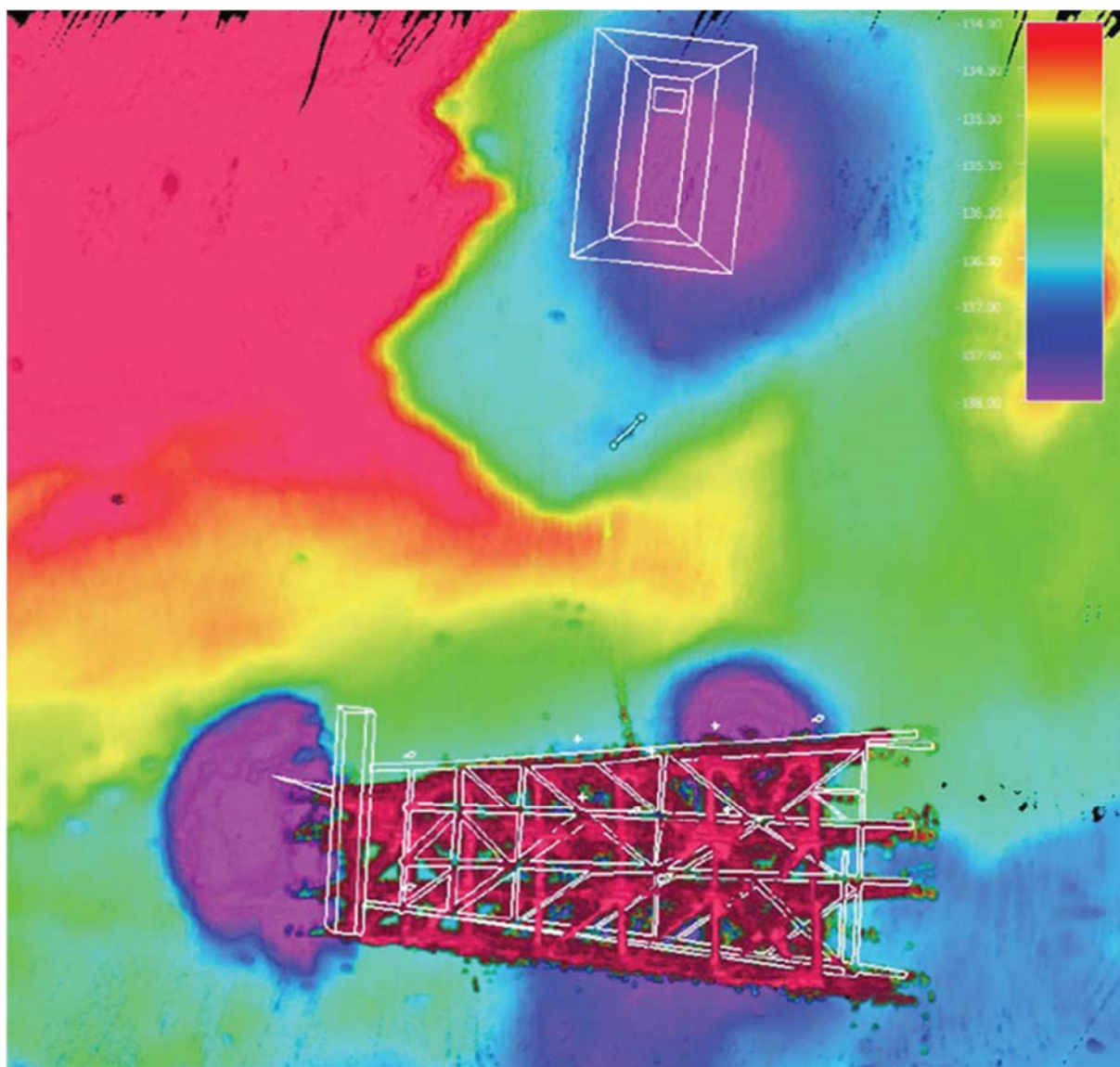


Figure 1. Bathymetric map of the MC20 study site showing the erosional pit on the northeast side of the toppled jacket. The depression at the western side of the jacket was created during removal operations of the superstructure on the jacket top.

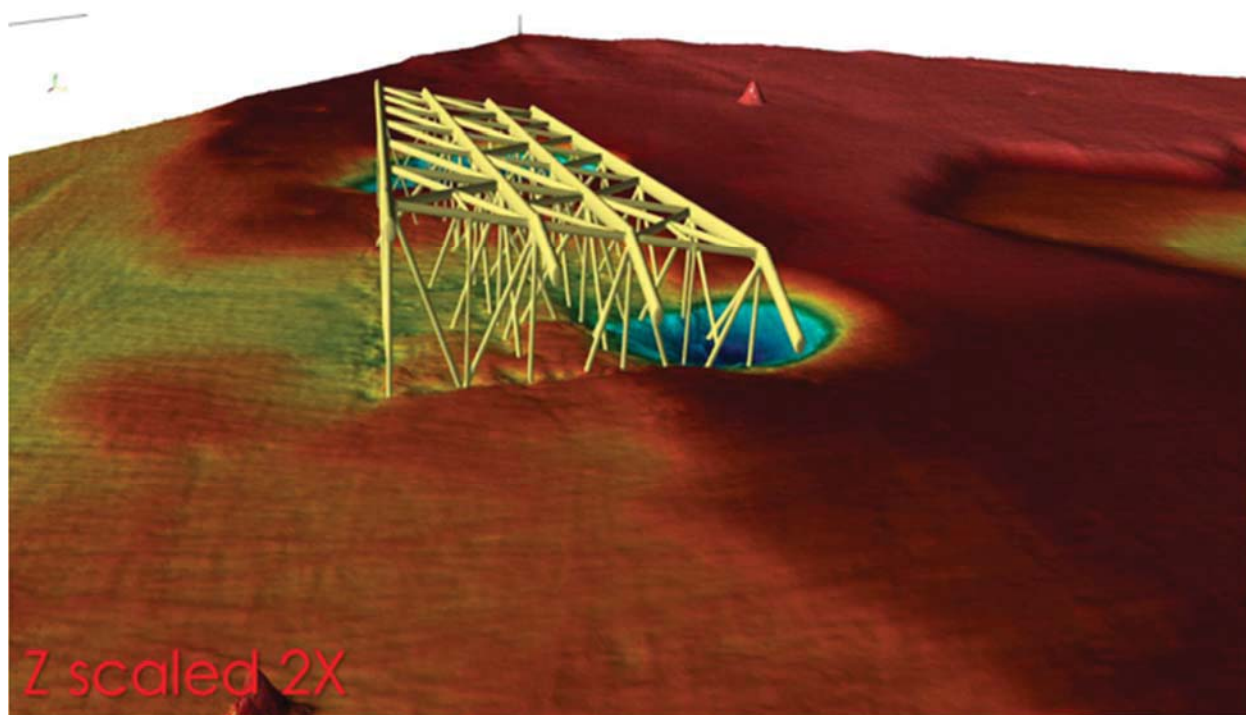


Figure 2. Another view of the erosional pit on the northeast side of the jacket.

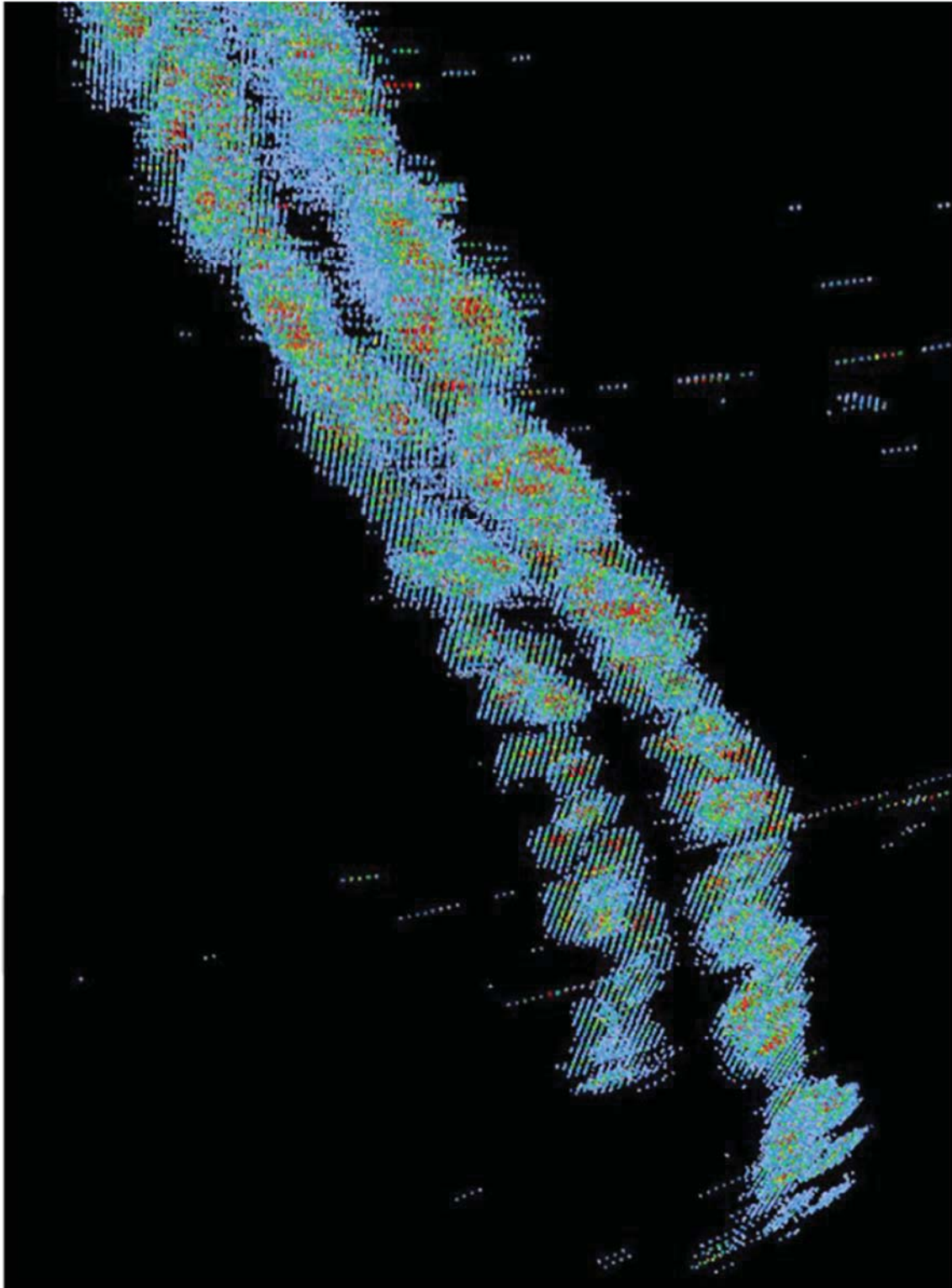


Figure 3. 3D sonar reconstruction of two distinct acoustic anomaly plumes observed emanating from the vicinity of the containment dome C erosional pit area on 16 March 2017. The microstructure of acoustic intensities (blue=lower intensity, red=higher intensity) within these plumes suggests a pulsating, non-steady-state release. These plumes each appear to be less than 20 feet in diameter at their base and are separated from each other by ~ 30 feet.

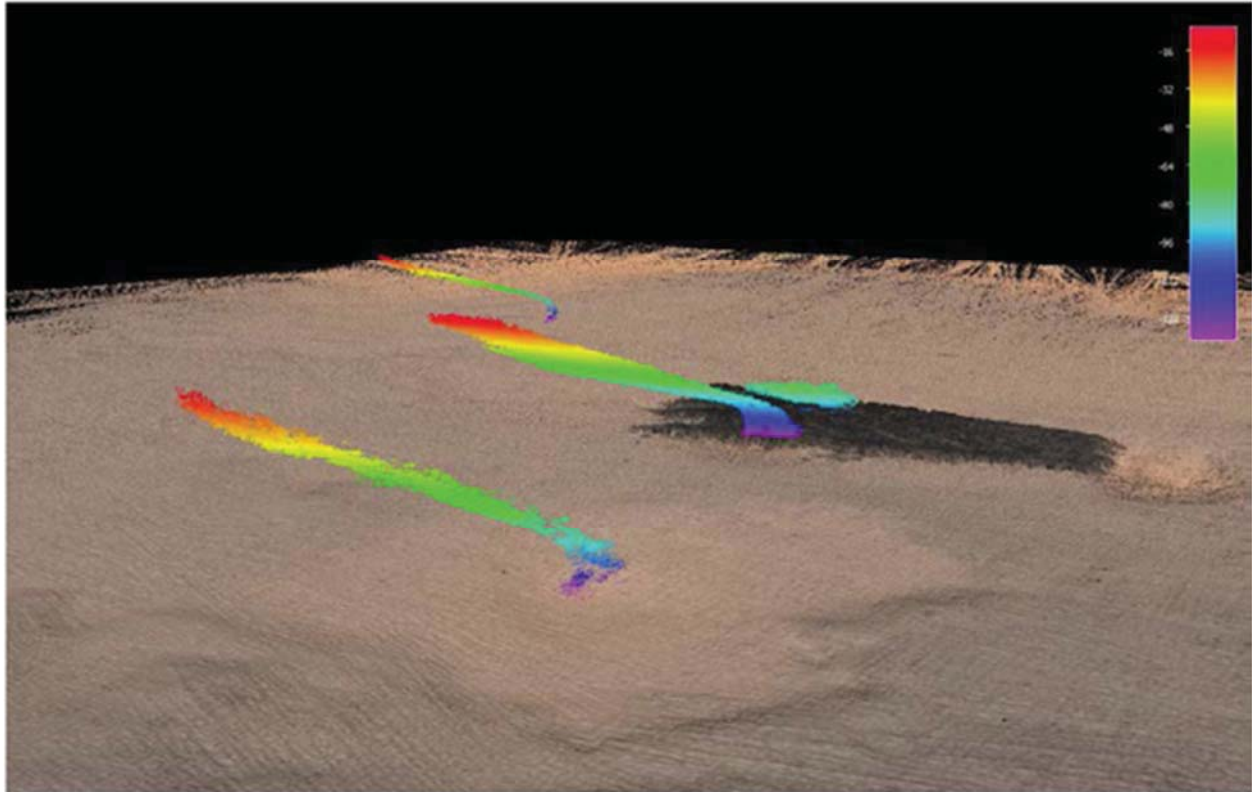


Figure 4. Perspective view of water column anomalies detection by sonar on 18 March 2017.

Color bar described the depth of the water column anomaly in meters. Note the two plumes near the area of containment Dome C. These plumes are a mixture of gas and oil. The plume in the foreground is the dry gas plume from the area of the former well bay. The distant plume is a dry gas plume about 1,000 feet southeast of the jacket. Similar water column anomalies were detected during most of the thirteen multibeam sonar surveys conducted between 8 March and 8 April 2017.